

Chapter 4. Management Goals and Direction



Introduction

This chapter presents the proposed management direction for the Reserve that is common to, or independent of, the alternatives eventually selected. In providing detailed management direction, it also provides a framework for the consideration of alternatives.

Management policy in this chapter is given for nine program areas comprising management of the Reserve:

- preservation of old-growth species and habitat (species management),
- restoration of old-growth and aquatic ecosystems (watershed restoration and forest restoration),
- research management,
- fire management,
- management of recreation access,
- cultural resource management,
- designation and management of special areas,
- resource monitoring and evaluation, and
- management revenue.

For each program area, management policy is given in three parts:

- management goals, which include desired outcomes;
- management direction, which includes allowable uses and needed actions; and

- implementation guidelines, which will guide implementation of the management direction.

Primary Focus of Reserve Management

The federal legislation authorizing acquisition of the Headwaters Forest established a primary management goal:

“To conserve and study the land, fish, wildlife, and forests . . . while providing public recreation opportunities and [meeting] other management needs.”

This primary management goal for the Reserve is also reflected in agreements between the federal and state agencies that share management responsibility for the Reserve.

The *primary focus of Reserve management* is to restore and maintain its ecological integrity and to study its ecological processes so as to improve that management. Recreation and other necessary management activities will be constrained as necessary to be consistent with the primary goal.

The Headwaters Forest was acquired by the people of the United States to conserve a unique remnant of the old-growth coastal forest of northwestern California that was once extensive but is now limited to a few parks and reserves in the region. The Headwaters old-growth forest is unique among these remnants because of its mix of large redwood and Douglas-fir tree species in association with other conifer species and its diversity of understory species. Conservation of this old-growth forest requires that its natural ecological structure, functions, and processes be preserved in unharvested groves and restored in the harvested forests stands that were included within the Reserve.

Management of this old-growth reserve will involve identification of needed research and protection of

- native species from human and mechanical disturbance that may inhibit their abundance and recovery,
- natural vegetation from invasion of exotic plants and degradation from human intrusion,
- special-status native animals from exotic animals, and
- all resources from fire.

Restoration of ecological functions and processes of harvested forests will involve

- reduction in sediment movement from disturbed forests to streams;
- minimization of unnatural drainage patterns;
- acceleration of plant succession in timber harvested areas;
- improvement of structural complexity in harvested areas;
- improvement of old-growth buffers;
- eventual elimination of forest fragmentation; and
- to the extent practicable, elimination of exotic organisms.

To the extent that they do not compromise these primary goals of Reserve management, opportunities will be provided for access to recreation values and for research that will promote better reserve management.

Species Management

Management of threatened and endangered species, as well as management of the Reserve's plant, fish, and wildlife species in general, has several important elements: restoration of natural watershed condition and process, restoration of second-growth forests to achieve old-growth characteristics, control of visitation, management of wildland fire, and management of monitoring and research. Those management program elements are described in detail in the subsequent major sections of this chapter.

This section addresses aspects of those program elements that are directly related to preservation and recovery of important species that inhabit the Reserve. It sets forth restrictions on various types of disturbance activities that are required to avoid jeopardizing the continued existence of the threatened and endangered species and other special-status species that populate the Reserve. Special-status species that occur or may occur in the Reserve are shown in table 3-6 (in chapter 3). Threatened or endangered species include coho salmon, chinook salmon, steelhead trout, marbled murrelet, northern spotted owl, and bald eagle.

Management Goals

Management goals for the Reserve will focus on restoring and enhancing habitat for those species uniquely adapted to old-growth forests. Past timber harvest in the Reserve has resulted in fragmented habitat, which supports nonendemic, edge-tolerant species, as well as endemic, old-growth-dependent species. For this reason, species richness as a whole is not a good measure of management success for the Reserve (Verner 1986).

The desired outcome of species management in the Reserve is the continued presence of all existing old-growth-dependent species that comprise or use the Reserve's forests, streams, or riparian systems and an expansion of populations of these species consistent with the Reserve's gradually increasing carrying capacity as a result of watershed and forest restoration programs. The desired outcome includes provisions for recreation access to the Reserve at times and in locations that do not significantly adversely affect activities of old-growth-dependent species.

Accordingly, the following general management goals are established for species management in the Reserve:

- Protect all extant populations of old-growth-dependent fish, wildlife, and plant species that occur on the Reserve from activities that could threaten their individual or population survivability.
- Increase populations of old-growth-dependent species commensurate with the capacity of recovering old-growth ecosystems.
- Where practicable and consistent with the overall size of the Reserve and other management considerations, restore populations of native species.
- Meet the other species-specific goals described below.

Species-Specific Goals, Management Direction, and Implementation Guidelines

Management actions specific to each species or species group are presented in this section, following a species-specific goal.

Aquatic Species

Management Goals

The Reserve has high capacity for the long-term conservation of threatened anadromous salmonids in the north coast region. The desired outcome of management of the Reserve's aquatic habitats is the expansion of high-quality spawning, rearing, and migration habitat for anadromous salmonids, including coho and chinook salmon, steelhead, and coastal cutthroat trout. Over time, watershed restoration and forest restoration should create properly functioning aquatic habitat conditions, which are essential to protect, maintain, and enhance the current populations and genetic integrity of threatened anadromous salmonids. Protection and restoration of aquatic habitats and the processes that shape and maintain their watersheds will be the primary goal. This goal is consistent with the "Aquatic Conservation Strategy" objectives of the Northwest Forest Plan.

Management Direction

Timber harvesting in the Reserve has degraded salmonid habitats, primarily through sedimentation, removal of overstory cover, and interruption of the cycling of large woody debris (LWD). Watershed and forest restoration will reverse these cumulatively significant adverse effects. Roads and log landings and some skid trails will be decommissioned where practicable to reduce the amount of sediment discharged to the Reserve's aquatic habitats (see "Watershed Restoration"). Tree density management will accelerate the recovery of watershed cover and LWD cycling (see "Forest Restoration"). Careful consideration of the timing of watershed and forest restoration activities will avoid or minimize the potential for physically disrupting anadromous fish or contributing sediments to streams when key fish life stages are present.

The suite of proposed actions that will promote the recovery of fish populations includes

- reducing sediment input to streams by road and log-landing decommissioning;
- reestablishing connectivity of the stream network by eliminating present and potential future fish barriers at road crossings and, when appropriate, at existing debris jams;
- reducing sediment input to streams by accelerating restoration of dense watershed cover through tree density management;
- promoting conifer growth along riparian areas;
- in some instances, enhancing channel habitat complexity by installing in-stream habitat structures, in consultation with DFG; and
- precluding off-trail hiking and sportfishing within the Reserve.

Implementation Guidelines

The potential for direct and indirect impacts on fish and critical fish habitat during trail-system development and restoration activities will be avoided or minimized by use of implementation guidelines specified in “Management of Recreation Access” and “Restoration of Old-Growth and Aquatic Ecosystems” below. Those guidelines address trail construction and maintenance, and field implementation of watershed and forest restoration actions.

The guidelines of direct benefit to fisheries that apply to watershed and forest restoration and trail-system development actions are listed below.

- Soil-disturbing activities will not normally be permitted in the rainy period, October 15–May 1, to minimize the potential for delivery of sediment to streams from surface erosion or mass-wasting events. Furthermore, such activities will not occur during summer when rainfall exceeds 0.25-inch during a 24-hour period. In such cases, soil-disturbing activities will not resume until after the soil is no wetter than is found during normal dust-abatement watering or light rainfall and it is determined that the soil will not rut (is not saturated beyond its plastic limit) or pump fines (i.e., extrude fine sediment when weight is applied to the surface). However, soil-disturbing activities may be permitted to continue after October 15 on a case-by-case basis when fall rains are delayed. Similarly, activities may be initiated prior to May 1 following dry winters on a case-by-case basis when it is determined that soil conditions are no wetter than are found during normal dust-abatement activities or light rainfall and the soil will not rut or pump fines.
- Emergency sediment-reduction work (e.g., unblocking culverts, stabilizing failing slopes or road prisms) may occur during the rainy-season closure period if necessary to prevent culvert stream diversion, or slope failure from contributing massive volumes of sediment directly to watercourses.
- Nonemergency activities requiring heavy equipment use in, or disturbance to, stream channels (e.g., removing culverts and road fills, installing habitat structures, removing debris jams that block migrating fish) will be permitted only during June 1–October 15 but before the fall migration of adult fish.

Marbled Murrelet

Management Goals

The desired outcome for management of the marbled murrelet is to preserve existing nesting habitat and expand nesting habitat to the entire Reserve, exclusive of the Elk River corridor. This is also USFWS’s desired outcome for this species at the Reserve as established in its recovery plan for this species (U.S. Fish and Wildlife Service 1997).

Both short-term and long-term goals for management of the Reserve are established to achieve this outcome. Short-term goals are listed below.

- Increase reproduction and survivorship of the marbled murrelets within the Reserve. Detailed life history information and demographic data are scant for the marbled murrelet, but long-term bird counts and demographic modeling indicate a long history of population decline. Declining populations decrease the ability of the species to recover from random adverse events such as large wildfires and oil spills. A large productive population is more likely to have the resilience to withstand environmental uncertainties.

- Maintain and protect all forest stands that are occupied by marbled murrelets or stands that are considered suitable nesting habitat. It is more effective to protect existing habitat than to create new habitat. Factors of concern are fire, flood, disease, and windthrow.
- Maintain and protect all forest stands that provide physical buffers to the suitable stands although they do not provide suitable nesting habitat. Buffers are important in increasing the effectiveness of extant suitable habitat.

The following are the long-term goals:

- Increase stand size of late-successional and old-growth forests. Larger stands have a greater core area that is not degraded by the influences of edge effects (e.g. humidity, temperature, predator access).
- Connect isolated late-successional and old-growth forest stands.
- Increase acreage of forest containing interior forest conditions (i.e., not susceptible to edge effects).
- Regrow late-successional and old-growth forest over the largest amount of the reserve practicable.

On the scale of the Reserve, reaching the long-term goals would result in nearly doubling the amount of quality nesting habitat for marbled murrelet and increasing the viability of the murrelet population by reducing bird vulnerability to natural and human-caused catastrophes. Meeting the goals would also enable marbled murrelets to more easily avoid their predators because they could use their cryptic coloring and secretive behavior in a much larger area that would make them more difficult to detect. Restoration of large-tree, thick multiple-canopy forest stands would increase visual and auditory separation of murrelets from the potential disturbance of human activities.

These goals are consistent with the Marbled Murrelet Recovery Plan and the Northwest Forest Plan.

Management Direction

- Implement silvicultural practices on all earlier successional harvested stands practicable that accelerate development of the maximum amount of contiguous suitable marbled murrelet nesting habitat.
- Implement road closure and decommissioning actions on the maximum practicable acreage to reunite the largest possible number of isolated and fragmented late-successional and old-growth stands in the Reserve.
- Develop and implement a program to reduce fuel hazards within the Reserve.
- Maximize marbled murrelet productivity and survivability through
 - minimizing actions that may cause auditory or visual disturbances to marbled murrelets by judiciously buffering human activities and motorized equipment operation with distance, topographic screening or vegetative screening, and establishing seasonal and/or hourly operating periods as determined in consultation with USFWS; and
 - supporting continued research into murrelet disturbance to further quantify and refine auditory and visual disturbance parameters.

- Minimize the availability of human food waste and other trash, which may serve as a source of food for predators (specifically corvids) of marbled murrelets. Accomplish this through educating visitors and limiting human activities near marbled murrelet nesting habitat.
- Initiate corvid frequency monitoring to detect trends in areas of visitor use, in early-successional vegetation, and in old-growth core areas (optimum marbled murrelet occupied sites).

Implementation Guidelines

The management direction for management of marbled murrelet habitat will be achieved by use of the following guidelines.

- No suitable habitat for the marbled murrelet will be removed or degraded.
- All recreation access, restoration activities, trail construction or maintenance activities, or other work requiring use of motorized equipment will be buffered from marbled murrelet nesting habitat during the period March 24–September 15 by using vegetative screening or topographic screening and establishing seasonal operating periods or a distance buffer of up to 0.25 mile, as determined in consultation with USFWS.
- During the breeding season, visitor use in all areas of the Reserve, except for the Elk River Corridor, may be restricted to the period between two hours after sunrise and two hours before sunset.
- Signs will be posted at all trailheads and along trails near potential routes into the old-growth stands informing visitors that off-trail hiking is prohibited year-round.
- Information on the importance of not feeding corvids (or other wildlife) and removing all food wastes and other trash from the Reserve will be provided to visitors, researchers, and management personnel. To convey this message, informational signs will be posted at trailheads and informational brochures will be provided to researchers, monitors, restoration contractors, and annual visitation permit holders (if permits are required).
- Rangers will be present to monitor and enforce visitor compliance with seasonal and hourly closures, prohibition of off-trail hiking, and prohibition of discarding food waste and other trash and to remove any food wastes and trash encountered.
- Picnic sites (short pathways and picnic tables) will be limited to the Elk River corridor.

Northern Spotted Owl

Management Goals

The desired outcome for the threatened northern spotted owl is protection of existing habitat and expansion of suitable habitat for nesting, roosting, foraging, and dispersal habitat at the Reserve. This goal is consistent with the Northwest Forest Plan objectives to restore and enhance old-growth habitat within the range of the northern spotted owl. The recovery of this threatened species may depend on providing large, contiguous blocks of old-growth habitat. For this reason, management of the Reserve will contribute to the recovery of the species on a regional scale.

Management Direction

The above goal will be achieved by restoring old-growth forests in previously harvested stands and minimizing disturbance to nesting owls. The restoration of up to 1,080–2,757 acres (depending upon the selected alternative) of previously harvested stands (as noted above) and the natural succession of stands in older harvested areas will eventually provide owls with a significant increase in suitable nesting, roosting, foraging, and dispersal habitat. Observing limited operating periods and no-disturbance buffers will minimize potential for disturbance to nesting owls. Monitoring known owl sites and periodic surveys of the entire Reserve will help determine the response of owls to implementation of the plan.

Implementation Guidelines

The above management direction will be achieved by use of the following guidelines.

- No suitable habitat for the northern spotted owl will be removed or degraded during watershed restoration, forest restoration, or trail development.
- All recreation access, restoration activities, trail construction or maintenance activities, or other work requiring use of motorized equipment will be buffered from northern spotted owl nesting habitat during the period February 1–July 31 by use of vegetative screening or topographic screening and establishment of seasonal operating periods or a distance buffer of up to 0.25 mile, as determined in consultation with USFWS.
- Signs will be posted at all trailheads and along trails near potential routes into the old-growth stands informing visitors that off-trail hiking is prohibited year-round.

Bald Eagle and Osprey

Management Goals

The desired outcome for these special-status species in the Reserve is maintenance and restoration of suitable roosting habitat.

Management Direction

The above goal will be achieved by conducting surveys for bird occurrences incidental to other monitoring and management activities, protecting any identified nests from human and mechanical disturbance, restoring natural old-growth ecosystems, and restoring and protecting aquatic habitats, as previously described.

Implementation Guidelines

If nesting of the species occurs at the Reserve, restoration activities will not occur within 0.5 mile of any nest during the breeding seasons:

- for bald eagle, January 15–August 15 or until the young have fledged; and
- for osprey, February 1–August 1 or until the young have fledged, unless field evaluation by a qualified biologist indicates that topographic or vegetative screening, or the birds' responses to existing disturbance, indicate that a smaller buffer will be adequate.

Migratory Birds

Management Goals

The desired outcome for migratory birds with potential to occur in the Reserve is to maintain or enhance current levels of use. The following management goals are consistent with Executive Order 13186 for Conservation of Migratory Birds (January 11, 2001):

- Avoid and minimize, to the extent practicable, adverse impacts on migratory bird resources when conducting forest and watershed restoration activities.
- Restore and enhance old-growth habitat for migratory birds.
- Prevent or abate pollution or detrimental alteration of environmental characteristics of benefit to migratory birds.

Management Direction

The above management goals will generally be achieved by restoring watershed and forest, observing limited operating periods, and restricting human access described for other species above. Appropriate site-specific alterations of planned actions will be made to minimize disturbance to nesting species, to the extent feasible. Ongoing monitoring of wildlife in the Reserve will provide information about changes in migratory bird use over time.

Implementation Guidelines

The deliberate removal of migratory bird nests during restoration activities is prohibited.

Amphibians and Reptiles

Management Goals

The desired outcome for special-status amphibians and reptiles in the Reserve is the restoration of aquatic and terrestrial habitat suitable for old-growth-dependent species. The southern torrent salamander, foothill yellow-legged frog, northern red-legged frog, tailed frog, and northwestern pond turtle are California state species of special concern and federal species of concern that potentially occur in stream habitats in the Reserve.

Management Direction

The above goal will be achieved by restoring natural ecosystems and avoiding disturbance to known populations during restoration implementation.

Implementation Guidelines

Disturbance of special-status amphibians and reptiles will be avoided to the extent practicable.

Survey-and-Manage Wildlife Species

Survey-and-Manage species refers to those species identified in the Northwest Forest Plan that because of rarity, endemism, or lack of information about the species might not be adequately protected by the broad-scale ecosystem approach of the Northwest Forest Plan (U.S. Forest Service and U.S. Department of Interior Bureau of Land Management 2001).

Management Goals

The desired future outcome of Reserve management is expanded knowledge about the occurrence and habitat needs of these species and the expansion of suitable habitats for them.

Management Direction

Identified populations of Survey-and-Manage species will be considered during restoration or trail-construction activities. Larger-scale regional surveys (Strategic Surveys) and local extensive surveys for these species will continue to be conducted by BLM and annual results entered into a regional database for evaluation.

Implementation Guidelines

The Northwest Forest Plan standards and guidelines for Survey-and-Manage species contains management components for six categories of species. If any Survey-and-Manage species are identified in the Reserve, the appropriate guidelines will be applied (appendix B).

Special-Status Vascular Plant Species

Only one special-status vascular plant species, heart-leaved twayblade, has been identified in the Reserve. There is a low probability of identifying additional populations of special-status vascular plant species populations because of the types of habitats and the location of the Reserve. Many of the special-status plants with potential to occur in the Reserve specialize in nonforested habitats, such as meadows, seeps, bogs or fens, and therefore any found populations are likely to be highly localized to these specific habitats. Two Survey-and-Manage species, clustered lady's-slipper (*Cypripedium fasciculatum*) and mountain lady's-slipper (*C. montanum*) have potential to occur in the Reserve (see "Survey-and-Manage Species" below).

Management Goals

The desired outcome for the special-status vascular plants at the Reserve is maintained or increased species richness. Goals are to protect and monitor populations of identified special-status vascular plant species and to avoid adversely impacting identified populations as a result of other management actions.

Management Direction

The primary management direction is to identify and avoid or protect localized populations during management activities. In general, watershed restoration actions will take place on roads, trails, landings, and other previously disturbed environments. Maple-leaved checkerbloom (*Sidalcea malachroides*), a CNPS List 1B plant, tends to be associated with these disturbed habitats. Forest restoration activities will focus actions on thinning previously harvested stands in upland habitats. Several species, including mountain lady's-slipper, maple-leaved checkbloom, Siskiyou checkerbloom, Indian pipe, and leafy-stemmed mitrewort, have potential to occur in these habitats.

Watershed and forest restoration activities will accelerate the return of old-growth forest types in the Reserve. It is acknowledged that old-growth forest types do not provide suitable or preferred habitats for the special-status species with potential to occur in the Reserve.

Implementation Guidelines

The management direction for special-status vascular plant species will be achieved by use of the following guidelines:

- Extensive cryptogram and forest stand density surveys will be conducted for special-status vascular plants with potential to occur in the Reserve.
- The extent of identified populations will be mapped, population size will be estimated, and habitats will be described.
- Direct adverse effects on special-status plants will be minimized or avoided to the extent feasible through project design, location of project activities, and observance of buffer areas around identified populations.
- Impacts will be avoided on habitats (typically bogs and fens) occupied by western lily (*Lilium occidentale*).
- Guidelines for Survey-and-Manage species (clustered lady's-slipper and mountain lady's-slipper) specified in the 2001 NFP ROD (appendix B) will be implemented.

Survey-and-Manage Plant Species

"Survey-and-Manage" was developed in the Northwest Forest Plan as a mitigation measure for timber harvesting to provide additional protection for species that, because of rarity, endemism, or lack of information about the species, might not be adequately protected by the broad-scale ecosystem approach of the Northwest Forest Plan (U.S. Forest Service and U.S. Department of Interior Bureau of Land Management 2001).

Management Goals

The desired future outcome of Reserve management is compilation of more information about Survey-and-Manage species and protection of habitat for rare species and high-priority sites for uncommon species. The long-term goal is to meet stability and distribution objectives for these species.

Management Direction

Management of the Reserve will focus on restoring watersheds and old-growth forest habitats and maintaining or enhancing species richness. Survey-and-Manage species, by definition, are associated with old-growth forest habitats, and therefore management goals for forest stands will be consistent with Survey-and-Manage plant and cryptogram species richness in the long term. The standards and guidelines for Survey-and-Manage species contains management components for six categories of species. For any Survey-and-Manage species identified in the Reserve the appropriate guidelines will be applied (appendix B).

Surveys for the presence of Survey-and-Manage species will continue. To date, no vascular plant species, 24 fungus species, and three lichen species in the Survey-and-Manage category have been identified. It is considered a high probability that additional Survey-and-Manage species will be identified.

Implementation Guidelines

Extensive plot surveys will be conducted within the Reserve and on late-successional reserves managed by the Arcata Field Office. Strategic Surveys will continue to be conducted by BLM and USFS. All results will be entered into a regional database for evaluation. Future monitoring of Survey-and-Manage species populations will occur as needed.

Invasive Nonnative Plants

Management Goals

The desired outcome for the invasive nonnative plants in the Reserve is the absence of infestations. The goals are to eliminate all existing populations and to prevent the establishment of new populations.

Management Direction

The management goal will be achieved through an inventory and mapping of nonnative plant populations in the Reserve (to be conducted in 2001), establishment of a priority for removal actions, and implementation of weed removal.

To prevent the establishment of new populations of invasive nonnative plants, specific weed prevention measures will be taken during management activities, and public education and outreach will be used to enlist visitors to help in preventing infestations.

Implementation Guidelines

Following completion of weed mapping and inventory, direct removal of weed infestations will occur using hand tools. Herbicides will not be used. Sites targeted for removal will be prioritized based on degree of invasiveness, size of the population, and location adjacent to vectors or suitable habitats.

During restoration project implementation, appropriate practices for prevention of the introduction or spread of invasive nonnative plants will be employed, including

- using certified weed-free mulch and straw in watershed restoration actions, and
- using native seed mixes for watershed revegetation.

To minimize the potential for introductions of invasive nonnative plant populations into the Reserve by equestrians, education and outreach actions will be implemented. If an alternative is chosen that provides for equestrian use, visitors will be provided with information and recommendations for managing equestrian use in a manner that minimizes the potential for introduction of seed of invasive nonnative plants (see “Implementation Guidelines for Recreation Access”).

Restoration of Old-Growth and Aquatic Ecosystems

The restoration program for the Reserve is intended to restore natural ecological functions and processes of old-growth forests, riparian forest corridors, and aquatic habitats. Accordingly, the restoration program addresses both

- reduction of sediment from roads, landings, and skid trails, or other previously disturbed areas, to benefit coho salmon, chinook salmon, steelhead, and other aquatic species; and
- tree and shrub density management to nurture old-growth characteristics in previously harvested stands and watershed restoration sites to benefit marbled murrelet, northern spotted owl, and other species that depend on old-growth forests, as well as aquatic species.

Watershed Restoration

Management Goals

The desired outcome of management of the Reserve’s watersheds involves restoration of natural patterns of runoff and natural levels of sediment movement through watersheds and streams. Combined with the restoration of old-growth forest in timber-harvest areas (as described in the forest restoration section below), watershed restoration would re-create high-quality aquatic habitats in and downstream of the Reserve, to the benefit of endangered anadromous fish species and other aquatic organisms.

Consistent with the watershed restoration concepts of the Aquatic Conservation Strategy of the Northwest Forest Plan, the following goals are established, in the following sequence of priority, to achieve the desired outcome:

- Maintain aquatic refugia within undisturbed old-growth forest habitat by keeping those systems intact and ensuring that natural processes operating within those systems are left undisturbed. These intact areas would serve as core areas of optimal habitat.
- Restore affected watersheds that have the highest potential for restoration and would provide the maximum benefits for aquatic species. Adjacency to existing undisturbed old-growth systems or stream segments and public control over the majority of land in the watershed, are factors that further elevate priority. These watersheds would serve to expand the size and effectiveness of core areas of optimal habitat.
- Continue watershed maintenance of the corridors along the main South Fork Elk River to reduce sediment inputs to the river. Because uplands are not in public control, effectiveness of more extensive watershed restoration treatments there would be limited.

Management Direction

Watershed Restoration Actions

Watershed restoration will involve decommissioning roads, log landings, and to the extent practicable, skid trails in the Reserve that are contributing or have the potential to contribute significant amounts of sediment to the Reserve's aquatic habitats. Work will include roadbed decommissioning, full excavation of stream crossings, and slope stabilization. Actions will include complete removal of culverts or Humboldt crossings, involving complete removal of fill material at stream crossings, decompaction of road surfaces by ripping, and, depending on the selected alternative and available funding, moving road fills into road cuts to recontour the surface to preroad conditions. The use of heavy equipment such as excavators, bulldozers, backhoes, and dump trucks will be required. Activities will be limited to minimize disturbance where adjacent to marbled murrelet habitat and to minimize sedimentation in streams. Projects can be cleared for northern spotted owls through surveys or limited operating periods where necessary. Vegetation that has colonized these roads and must be removed for these actions will be used to mulch the finished soil surfaces.

Table 4-1 and figure 4-1 indicate the extent of work that will be required to eliminate the significant sources of sediment in each of the Reserve's watersheds, according to an inventory of high yield sites (PWA 2000a, 2000b, 2001). Conditions in each of these watersheds were described in chapter 3, "Affected Environment (Environmental Setting) and Interim Management of the Reserve)."

Other actions related to watershed restoration include road-to-trail conversion, trail repair, and emergency sediment reduction actions. Guidelines for trail construction appear in the Recreation Access section. Trail repair will include replacement of culverts, ditch cleaning, surface shaping, and rock surfacing. The use of backhoe, motor grader, dump trucks, and all-terrain vehicles will be required. Emergency sediment reduction includes cleaning culverts, removing culverts, constructing waterbars, constructing rock-armored swales, moving landslide material to a stable location, and applying weed-free mulch. Such emergency work may be done in the winter rainy season.

Table 4-1. Extent of Road Decommissioning Needed in the Reserve

Watershed	Number of Roads	Total Road Length (mile)	Number of Stream Crossings	Number of Land-slides	Number of Other Sites	Total Earthwork Volume ^b (KCY)	Total Disturbed Area ^b (acre)
Upper Little South Fork Elk River	1	0.89	3	8	0	31.7–53.0	12–15
Salmon Creek	24	14.74	50	22	2	383.8–542.9	181–201
Upper South Fork Elk River (Elkhead Springs)	18	9.60 ^a	48 ^a	8 ^a	7 ^a	139.2–385.2	77–89
Lower Little South Fork Elk River	<u>19</u>	<u>9.9^a</u>	<u>20^a</u>	<u>8^a</u>	<u>0^a</u>	<u>77.8–261.4</u>	<u>71–79</u>
Total	62	35.13	122	49	10	632.4–1,242.5	341–384

Note: KCY = thousands of cubic yards

^a Estimate, based on sample of watershed

^b Range is for hydrologic decommissioning to full recontouring (thousands of cubic yards)

Source: PWA 2001.

Watershed Restoration Priorities

The factors determining priority of areas to be treated are

- the need to keep largely undisturbed old-growth forests intact as core habitat areas,
- adjacency to old-growth,
- the amount of old-growth/second-growth components,
- existing range of anadromous fish,
- the ability to control upland effects such as sedimentation,
- expediency of treatment, and
- effectiveness of treatment.

Accordingly, as summarized in table 4-2, area priorities for watershed restoration actions are

- Priority 1: Upper Little South Fork Elk River watershed—completing restoration of the Headwaters Old-Growth Road;
- Priority 2: Salmon Creek watershed;
- Priority 3: Upper South Fork Elk River watershed (Elkhead Springs area);
- Priority 4: Lower Little South Fork Elk River watershed; and

- No Priority: South Fork Elk River corridors. (The Elk River Road will undergo hydrologic stabilization and conversion to a trail, followed by annual maintenance to minimize sediment yield.)

As described in the Forest Restoration section below, these area priorities apply to both the watershed restoration and forest restoration programs. Future funding constraints will determine how rapidly sites in various priority areas are treated.

Table 4-2. Factors Determining Priority of Watersheds for Watershed Restoration

Priority	Watershed	Adjacency to Old-Growth ^a	Second-Growth Component ^b	Occupied by Anadromous Fish Species ^c	Control of Upland Effects ^d	Expediency ^e	Effective-ness of Treatment ^f
1	Upper Little South Fork Elk River	Within	Negligible	No	Yes	Very high	High
2	Salmon Creek	Within and immediate	Moderate upslope	Yes	Yes	High	Very high
3	Upper South Fork Elk River (Elkhead Springs)	Within and immediate	Large component	Yes	Yes	High	Moderate
4	Lower Little South Fork Elk River	None	All	Yes	No	Moderate	Moderate
None	South Fork Elk River Corridors	None	All	Yes	No	Moderate	Moderate

^a Describes where old-growth stands that have not been entered can be found within the watershed in relation to the drainage mainstem. "None" indicates that the watershed does not have any old-growth stands that have not been entered.

^b Describes extent and location of entered second-growth component within the watershed.

^c Indicates whether watershed is occupied by anadromous fish.

^d Indicates the extent of control of watershed effects such as tributary inputs or potential sediment sources.

^e Relative ease or ability to fully implement.

^f Relative effectiveness of a fully implemented restoration program in the watershed.

Watershed Restoration Intensities

Two treatment intensities of Priority 1–4 sediment-yielding sites are feasible: "hydrologic stabilization" or "full recontour" to natural configuration.

- Hydrologic Stabilization includes full excavation of stream crossings to original channel configuration to approximate natural channel conditions; excavation of unstable fillslopes; storing excavated material in stable locations away from streams; and providing permanent surface drainage for the remainder of the road through ripping (decompaction), construction of cross road drains, and partial outsloping.

- Full Recontour includes full excavation of all stream crossings with 2:1 side slopes; swale excavations with 2:1 side slopes; and spoil allocation or disposal to reestablish to the maximum extent possible original topography and channel morphology.

The choice of the preferred intensity for watershed restoration in the Reserve, if adequate funding is available, including relative earthwork volumes and costs, is addressed in chapter 5, “Management Alternatives.”

All treated areas will be mulched with native vegetation uprooted during the road-decommissioning process and scattered on top of the disturbed soil. In addition, rice straw will be used near watercourses, seeps, springs, and other areas as necessary to reduce the amount of surface erosion possible during the first two rainy seasons. Future management of revegetation is addressed in the Forest Restoration section below. Watershed restoration will not constrain future trail location, although, in some cases, trails may be constructed along alignments similar to existing roads.

Implementation Guidelines

Detailed implementation plans for some of the required treatments, and estimated needs in other areas, are given in reports prepared by PWA (2000a, 2000b, 2001).

The following operational guidelines will apply to watershed restoration actions:

- All recreation access, restoration activities, trail construction or maintenance activities, or other work requiring use of motorized equipment will be buffered from marbled murrelet and spotted owl nesting habitat during the periods March 24–September 15 and February 1–July 31, respectively, by use of vegetative screening or topographic screening and establishment of seasonal operating periods or a distance buffer of up to 0.25 mile, as determined in consultation with USFWS. All guidelines are subject to consultation with USFWS.
- Disruption of natural hydrologic flow paths, including diversion of streamflow and interception of surface and subsurface flow, will be minimized.
- Vegetation will be lopped and scattered on treated road surfaces to prevent rainfall from directly affecting soils until planted vegetation is extensive. Stems will be placed in the downslope direction.
- Sidecasting will be restricted as necessary to prevent the introduction of sediment into streams.
- New culverts, bridges, and other stream crossings will be constructed and existing structures will be maintained to accommodate at least the 100-year flood, including associated bedload and debris. Crossings will be constructed and maintained to prevent diversion of streamflow out of channels and down the trail or road surface in the event of a crossing failure.
- Fish passage will be provided and maintained at all road crossings of existing and potential fish-bearing streams.
- All feasible techniques will be used to prevent any sediment from entering a drainage system during road restoration/rehabilitation work. Heavy-equipment operators with experience in watershed restoration will be sought. A BLM project inspector, or designee, should be onsite during operations to ensure that proper procedures are followed.

- Heavy equipment will be inspected daily to check for fluid leaks. Equipment that leaks lubricants or fuels will not be used until leaks are repaired. Refueling should be done outside of riparian reserves and away from stream crossings. A spill plan should be available to onsite personnel.
- Interpretive guides will be instructed to make radio contact with heavy equipment operators to warn of presence of visitors.
- Truck speeds will be limited to 10 mph where visitors may be present.
- All restoration personnel will be briefed on the importance of not discarding food scraps or refuse or attempting to feed wildlife.

Forest Restoration

Management Goals

The Reserve has extremely high capability for rapid growth and development of large trees. The desired outcome of management of the Reserve's forests involves restoration of old-growth characteristics throughout the nonriparian areas of the Reserve. Together with the restoration of natural watershed conditions, as described in the watershed restoration section above, forest restoration would recreate high quality habitats on the Reserve to the benefit of threatened marbled murrelet and northern spotted owl, other terrestrial wildlife, nonvascular plants of old-growth forest understory, threatened anadromous fish, and other aquatic organisms.

Marbled murrelet and northern spotted owl depend on certain structural attributes of forest stands and individual trees for important phases of their life cycles. Attributes to be restored are large, continuous stands of large trees that have decadent and deformed, closed, multi-layered canopies. Very large trees with thick crowns and large lateral limbs and deformities, which will develop with increasing stand age and decadence, will provide important habitat niches such as nest site platforms, nesting and roosting cavities, and overhead protection from predators.

Consistent with the habitat restoration concepts of the Northwest Forest Plan, goals for forest restoration give first priority to maintaining and restoring the integrity of existing old-growth forest stands, followed by actions to expand these habitat beyond existing core areas. The following goals are established to achieve the desired outcome:

- Maintain undisturbed old-growth forest habitat by keeping those systems intact and ensuring that natural processes operating within those systems are left undisturbed. These intact areas would serve as core areas of optimal habitat.
- Restore second-growth forests to achieve old-growth characteristics. Adjacency to existing undisturbed old-growth systems further elevates priority. This restoration would serve to expand the size and effectiveness of core areas of optimal habitat. The results of restoration will be
 - ❑ accelerated rate of succession among forest seral stages,
 - ❑ created continuity between old-growth and other seral stages as they advance successionaly,
 - ❑ restored structural diversity of the second-growth stands, and
 - ❑ enriched species composition of the second-growth stands.

- Eliminate invasive nonnative plants from the Reserve.

Management Direction

An extensive body of research has shown that stand structure characteristics become established at an early stand age and that the restoration of old-growth forest ecosystems in previously harvested stands can be accelerated through manipulating tree density. By providing appropriate spacing early in stand development, crown formation and growth rates will be dramatically improved. Stand density manipulation will be used to achieve old-growth forest attributes within shorter timeframes than in unmanaged stands. Some unmanaged stands may never attain desired old-growth characteristics due to the deleterious effects of high density on crown development and growth rates.

Forest Restoration Actions

Restoration actions will involve stem-density management (tree thinnings) and tanoak control in shrub-sapling stands and sapling-dominated openings in seed-tree harvested stands, and perhaps in pole stands and pole-dominated openings in seed-tree harvested stands (see chapter 5, “Management Alternatives”), which are the result of prior timber harvesting. First priority will be given to revegetating watershed restoration sites in old-growth areas (i.e., the Headwaters Old-Growth Road) and to treating harvested stands with old-growth remnants (i.e., stands harvested with seed-tree retention prescriptions). Harvested stands comprised of early-mature and older seral stages (i.e., stands having average stem diameters over 12 inches) will generally not be treated because thinning would create unacceptable fuel loading or require road development for biomass removal. Though maintaining growth, thinning in older stands does not significantly affect tree and stand characteristics, as these attributes have already been established. For these reasons, a more intense forest restoration alternative, in which density management would be carried out in all previously harvested stands (high-intensity forest restoration), has been eliminated from detailed consideration (appendix J).

Forest restoration objectives for each seral stage, including related management issues, are shown in table 4-3. Objectives to be incorporated into restoration prescriptions include

- reducing stem densities to accelerate growth rates and succession into early- and mid-mature stages and to create more diverse and healthy stand structures;
- developing stand structure to soften the spatial transition from old-growth to second-growth stands (i.e., reduce wildlife-related edge effects, such as elevated temperatures, lowered humidity, increased predator access, and increased con-specific [same species] competition);
- reestablishing continuous forest canopy in harvested stands with old-growth remnants;
- nurturing connectivity between old-growth stands; and
- establishing new stands on disturbed sites, which are primarily watershed restoration sites.

Table 4-4 indicates the extent of seral stages in each watershed area that may be treated. Forest seral stages in the Reserve were described in chapter 3, “Affected Environment (Environmental Setting) and Interim Management of the Reserve.”

Forest Restoration Priorities

Factors determining the level of priority of areas to be treated are related to the potential to restore ecosystem integrity. The factors include

- fragmentation of existing forest,
- presence of seed-tree harvested areas containing legacy or residual old-growth trees with shrub- and sapling-dominated openings,
- presence of sapling and pole stands,
- adjacency to old-growth,
- expediency of treatment, and
- effectiveness of treatment.

Priority is highest for watersheds having the least fragmented old-growth forests: Upper Little South Fork Elk River watershed, the Salmon Creek watershed, and the Upper South Fork Elk River watershed (Elkhead Spring area), in that order. In these areas, priorities are highest in gaps in the existing old-growth forest, along edges of old-growth forest, and in areas that will eventually reconnect major existing stands of old-growth. Subject to these landscape priorities are the following treatment priorities, which are based on seral stage:

- **First priority**—Seed-tree harvested stands (stands with remnant old-growth trees interspersed with shrub/sapling openings and pole stands),
- **Second priority**—shrub-sapling harvested stands (most-recently harvested stands now dominated by shrubs and saplings), and
- **Third priority**—pole harvested stands (older harvested stands now dominated by pole-sized second-growth trees).

Sites disturbed during watershed restoration activities will also be given high priority for action, which will include revegetation and subsequent density management through sapling and pole stages.

In summary, as shown in table 4-4, area priorities for forest restoration actions are in the following order.

- **Priority 1:** Upper Little South Fork Elk River watershed—completing restoration of the Headwaters Old-Growth Road.
- **Priority 2:** Salmon Creek watershed—watershed restoration sites, seed-tree harvested, shrub-sapling harvested, and pole harvested stands.
- **Priority 3:** Upper South Fork Elk River watershed (Elkhead Springs area)—watershed restoration sites, shrub-sapling harvested, and pole harvested stands.
- **Priority 4:** Lower Little South Fork Elk River watershed—watershed restoration sites, shrub-sapling harvested, and pole harvested stands.
- **No Priority:** South Fork Elk River corridors (primarily riparian zones).

As described in the Watershed Restoration section above, these area priorities apply to both the watershed restoration and forest restoration programs. Future funding constraints will determine

how rapidly sites in various priority areas are treated or if lower intensity treatments are necessary.

Forest Restoration Intensities

Two treatment intensities of Priority 1–4 areas are feasible:

- **Moderate Intensity Forest Restoration.** Density management would be conducted in both pole and shrub-sapling stands and openings. Two to three entries in shrub-sapling stands and in revegetated watershed-restoration sites would be made as needed, and a single entry would be made in pole stands considered appropriate for such action.
- **Low Intensity Forest Restoration.** Density management would be conducted only in sapling/shrub stands and openings and in revegetated watershed-restoration sites, limited to one entry.

The choice of the preferred intensity for forest restoration in the Reserve, if adequate funding is available, is addressed in chapter 5, “Management Alternatives.”

Focus of density management will be on Douglas-fir. Redwoods, including stump sprouts, usually will not require treatment to restore a natural mix of Douglas-fir and redwood species.

Density-management treatments will not yield commercial forest products; all biomass will be left on-site and may be lopped and scattered, piled and burned, or chipped. Chain saws, mechanical brush cutters, and chippers may be used. Permanent or temporary roads or skid trails will not be developed for access to treatment sites, but temporary access routes may be developed where they will subsequently be removed during watershed restoration activities. Herbicides will not be used.

Control of Invasive Nonnative Species

Invasive, nonnative species will be controlled using manual or natural means. Watershed restoration followed by forest restoration will generally create sufficient shade to suppress invasive species that require exposure to full sunlight to thrive. Where openings in the forest canopy will remain (e.g., along trails), invasive, nonnative species will be controlled, and eliminated if possible, by cutting with hand tools. Herbicides will not be used. Monitoring the presence of invasive nonnative species will focus on trail corridors, especially heavily used trails and areas adjacent to trailheads.

Implementation Guidelines

The following guidelines are prescriptive details for forest restoration.

- Vegetation species composition, individual tree densities, and canopy closures will be managed in some or all of the stands comprising two or three of the five identified seral stages characterizing the Reserve: shrub-sapling harvested, pole harvested, and seed-tree harvested. Pole harvested stands may or may not be treated, depending on the selected forest-restoration alternative.

- In a medium-intensity program, shrub-sapling harvested and seed-tree harvested stands, as well as revegetated watershed restoration sites, would be entered up to three times over a 20-to-30-year time period. In a low-intensity program, only one entry would be made. Typically, single entry into the pole stands would be made in a medium-intensity program.
- Stem diameters of material removed in pole stands will be up to 14 inches, and stem diameters in the other stands will be up to six inches. Estimates of the number of trees to be cut or retained and slash weights for these program levels are given in tables 4-5 and 4-6.
- All material will be cut using chain saws. Slash will be treated by machine chipping, lopping to 48-inch maximum lengths, or, where the previous two methods will create hazardous conditions, by hand piling and burning. The method of slash disposal will be based on amount and size of material removed from the stand, the characteristics of the residual stand, topographic/aspect conditions of the site relative to spread of fire, and equipment access.
- In pole stands, up to 10 stems per acre having the larger diameters (10–14 inches) may be left on the forest floor uncut as moderate woody debris (MWD) if all branches are removed and the stem lies in continuous contact with the soil surface.
- Trees will be thinned using variable-density approaches. The variable-thinning approach is an appropriate method for augmenting the natural processes that result in old-growth characteristics (as described in chapter 6, “Environmental Consequences (Environmental Effects and Alternative Comparisons)”) and will be used where appropriate. With this approach, the rate of thinning will be varied throughout the stand, based on topographic/aspect conditions. The number of retained (dominant) trees for the various stand types and entries is shown in tables 4-5 and 4-6.
- Selection of the dominant trees and of the larger poles for MWD recruitment will be a result of field evaluation of individual tree characteristics suitable for dominance and the need to remove surrounding vegetation to accelerate dominance.
- No tree thinning will be conducted in stream management zones as specified in the “Aquatic Conservation Strategy” of the Northwest Forest Plan. However, where competition for sunlight is evident, poles bordering these zones will be removed with the intent of increasing sunlight to riparian vegetation communities or of improving long-term LWD recruitment.

Research Management

Management Goals

The authorizing legislation for the Reserve requires that this plan address “scientific research on forests, fish, wildlife, and other such activities that will be fostered and permitted on the Headwaters Forest.” The desired outcome of management of research is a balance between the gathering of important scientific data, needed to understand and protect ecological integrity of the Reserve, and protecting that integrity from the intrusion of the monitoring process. BLM and DFG welcome consideration of the Reserve for research/monitoring proposals.

The management goal for achieving this outcome was given in the authorizing legislation for creation of the Reserve—“to conserve and study the land, fish, and wildlife, and forests occurring on such land while providing public recreation opportunities and [meeting] other management needs.”

A second management goal established here is to encourage research that involves monitoring and studying the Reserve's attributes potentially affected by the management direction established by this plan and to provide baseline monitoring to measure changes/impacts from private timberland harvesting.

Management of the Reserve's resources in unimpaired condition, while providing appropriate visitor use, requires a full understanding of resource components, their interrelationships and processes, and effects of visitation, which can be obtained only by the accumulation and analysis of information produced by scientific methods. Appropriate scientific studies should be designed to increase understanding of human and ecological processes and resources and/or to seek to understand the unique values of the Reserve. The ultimate goal of research at the Reserve must be to develop scientific understanding to further the goals for which the Reserve is established.

Management Direction

Use of Permit System

A research/monitoring permit will be required for most scientific activities pertaining to natural resources or social science studies in the Reserve that involve fieldwork or specimen collection and/or have the potential to disturb resources or visitors. When permits are required for scientific activities pertaining solely to cultural resources, including archaeology, ethnography, history, cultural museum objects, cultural landscapes, and historic and prehistoric structures, other permit procedures apply. BLM may authorize staff to carry out official duties without requiring a permit. BLM staff must comply with professional standards and conditions normally associated with scientific research/monitoring permits issued by BLM.

BLM will approve or deny a research/monitoring permit based on an evaluation of favorable and unfavorable factors and on an assessment of perceived risks and benefits. Although BLM staff will work with applicants to arrive at a mutually acceptable research design, there may be activities where no acceptable mitigating measures are possible and the application may be denied.

Types of Research to be Conducted

Six types of research will be conducted at the Reserve. Research in the first five categories is of highest priority.

- **Pacific Lumber Company's Habitat Conservation Plan (HCP) Monitoring Commitments.** This HCP contains specific requirements for forest ecosystem monitoring to ensure that specific thresholds are being met or not exceeded on PALCO's timberlands or to document ecological conditions on a landscape scale. For the latter, many of these requirements involve monitoring, inventory, and research activities within the Reserve. BLM will continue to coordinate with the HCP interagency monitoring group to permit these activities as necessary on Reserve lands.
- **Marbled Murrelet Recovery Plan.** This recovery plan indicates that current population size and trend information needs to be refined through additional at-sea surveys, refined survey sampling design, and data analysis techniques. Information on marbled murrelet survivorship estimates and juvenile:adult ratios at sea also needs to be collected over a number of years (e.g., 5–10 years) to further validate the current population model. Several years are required

to account for possible natural variability and the periodic occurrence of El Niño (and other warmwater) conditions that may lead to variation in breeding success.

- **Watershed Restoration and Stabilization Program.** Sediment source inventory and monitoring is critical to maintaining aquatic ecosystem integrity in both the short and long terms. BLM will continue sediment-source monitoring and assessment to prevent or minimize catastrophic releases of sediment and to gauge the success of road decommissioning and other sediment-reduction activities throughout the Reserve (see “Watershed Restoration”).
- **Compliance with Environmental Law.** Activities within the Reserve require monitoring for compliance with all environmental laws and regulations described in chapter 2, including plan-specific mitigation monitoring under CEQA and monitoring requirements of USFWS and NMFS to ensure compliance with ESA. These laws require monitoring the effects of planning programs and implementation of mitigation measures for projects undertaken pursuant to this plan. Mitigation monitoring needs under CEQA and anticipated monitoring requirements under ESA are described in “Resource Monitoring and Evaluation” in a subsequent section of this chapter.
- **Basis for Long-Term Adaptive Management and Planning.** Highly related to but extending beyond monitoring for environmental compliance, research will be needed for assessing management of the Reserve. Management planning will be ongoing and will be based on continued ecosystem analyses and monitoring of results of plan implementation. BLM will continue to develop data about particular aspects of the Reserve that are critical to planning decisions, including
 - ❑ sediment source inventories;
 - ❑ forest stands inventories;
 - ❑ visitor data, both quantitative and qualitative;
 - ❑ improved vegetation data;
 - ❑ road and skid trail network inventories;
 - ❑ nonvascular plant inventories;
 - ❑ other floral and faunal monitoring and inventory; and
 - ❑ possibly others.

Specific monitoring needs for implementation of this plan are described in “Resource Monitoring and Evaluation” in a subsequent section of this chapter.

- **Basic Research.** In addition to the above research and monitoring, basic research into ecosystem process, structure, and function should be conducted at the Reserve. Such research need not necessarily be focused on a current management issue but may be of value to a better understanding of the functioning of old-growth ecosystems in the north coast region. This type of research would most likely be conducted by scientists affiliated with academic institutions or government research agencies.

Criteria for Approval of Research Proposals

Several factors will be considered in evaluating proposed research at the Reserve (see “Implementation Guidelines” below). The primary factor favorable for approval is a showing that the research contributes information useful to an increased understanding of the Reserve’s

resources and thereby contributes to effective management and/or interpretation of resources or addresses problems or questions of importance to science or society and shows promise of making an important contribution to such knowledge. Other important criteria must be met, however.

Implementation Guidelines

Research Proposal Evaluation Criteria

Several factors will be considered by BLM and DFG in approving research at the Reserve. Favorable and unfavorable factors, as well as specific information needs, are described in this section.

The suitability of proposed research increases when

- information is useful to an increased understanding of the Reserve's resources and thereby contributes to effective management and/or interpretation of resources;
- sharing of information is scheduled with BLM, including any manuscripts, publication, maps, and databases that the researcher is willing to share;
- problems or questions are of importance to science or society and show promise of making an important contribution to knowledge of the subject matter;
- a principal investigator and support team with a record of accomplishment in the proposed field of investigation have demonstrated ability to work cooperatively and safely and to accomplish the desired tasks within a reasonable timeframe;
- the investigators prepare occasional summaries of findings for public use, such as seminars and brochures;
- natural and cultural resources, operations, and visitors are not disrupted;
- cataloging and care of collected specimens is planned;
- detail about provisions for meeting logistical needs are provided;
- the research is supported academically and financially; and
- fieldwork, analyses, and reporting will all be completed within a reasonable time frame.

The suitability of proposed research diminishes when

- activities adversely affect the natural resources or the experiences of visitors;
- there is potential for adverse impact on natural, cultural, or scenic resources, particularly on nonrenewable resources, such as archaeological and fossil sites or special-status species;
- the research is redundant to previous research conducted in the Reserve or in other similar ecosystems (unless designed to corroborate studies in other areas);
- potential exists for creating risk of hazard to the researchers, visitors, or ecosystem integrity;
- extensive collecting of natural materials is planned or unnecessarily replicates existing voucher collections;

- substantial logistical, administrative, curatorial, or project monitoring support by BLM staff is required;
- time is insufficient to allow necessary review and consultation;
- the principal investigator lacks scientific institutional affiliation and/or recognized experience conducting scientific research; and
- scientific detail and justification are inadequate to support achieving the study objectives.

Finally, research proposals must address the following elements to receive consideration:

- power equipment or potentially hazardous materials to be used;
- numbers of staff entering the Reserve;
- duration and frequency of field visits;
- degree of staff intrusion into old-growth forest groves;
- conformance with seasonal and daily operating period closures due to marbled murrelet activity;
- conformance with wet-season operating restrictions;
- use of existing roads and trails;
- limiting of flagging, marking of survey stations, and other intrusions; and
- actions to minimize impacts on visitors, wildlife, and ecosystems (e.g., food storage, trash storage).

Research Overnight Occupancy Guidelines

Overnight camping for researchers will be minimized, but may be authorized on a restricted trial basis. The requirements below are intended to minimize the threat that corvids present to the threatened marbled murrelet, by avoiding human behaviors that are known to attract corvids and to minimize hourly and seasonally, the potential for disturbing murrelet nesting. Under no circumstances should a corvid have a successful feeding attempt as a result of authorized research and associated camping. The following is a preliminary list and will be updated as needed through the research permit process.

- No littering of any kind, including discharge of chemical or biodegradable substances.
- Researchers must carry a copy of their research permit on their persons and display a copy on the dashboard of vehicles parked at Reserve trailheads.
- Camping is prohibited within 0.25 mile of the old-growth groves and within 150 feet of surface water. Former log landings should be used for camping whenever possible.
- Research communication radio speakers must be no louder than a normal human voice in quiet conversation.
- Radios, CD/tape players, boom boxes, howling, and hooting are prohibited. Voices should be no louder than a normal human voice in quiet conversation.
- Tents will be dismantled by eight a.m. and will not be left standing during the day. Campsites will be dismantled, packed, and stowed under shrubbery to reduce line of sight from the air as well as from visitors.

- Avoid or minimize disturbance to vegetation, downed logs with cryptogamic communities, and other natural elements of the forest floor.
- No open campfires are allowed. Gas stoves and lanterns are allowed, contingent on current fire restrictions.
- Should researcher encounter corvids during their stay, they should note the location of the encounter, the number of birds observed, and whether corvid feeding on food wastes was attempted or successful and notify the Arcata Field Office of the BLM.

Research Permit Procedure Guidelines

The following guidelines will apply to all permit applications for research/monitoring.

- **Permit Authorization.** BLM will authorize research and monitoring proposals under 43 CFR 2920, “Leases, Permits, and Easements through issuance of a Special Use Permit.”
- **Qualified Applicants.** Any individual may apply if he/she has qualifications and experience to conduct scientific studies or represents a reputable scientific or educational institution or a federal, tribal, or state agency.
- **Processing Time Requirements.** It is recommended that application for permits be received by BLM at least 180 days in advance of first planned field activities. Projects requiring access to restricted locations or during critical nesting seasons or projects proposing activities with sensitive resources, such as threatened and endangered species or cultural sites, usually require extensive review and can require 90 days or longer to complete any needed consultations with NMFS and/or USFWS.
- **Additional Required Approvals.** In some cases, other federal or state agency permits or approvals may be required before BLM can approve an application for a research/monitoring permit. The principal investigator is required to provide BLM with copies of such permits with its application. (Applicants are encouraged to contact BLM staff to determine if additional permits may be required in conjunction with a proposed study.)
- **Location of Application.** Application materials may be obtained from the BLM Arcata Field Office at 1695 Heindon Road, Arcata, California 95521 (Phone: (707) 825-2300). All application materials must be submitted to this office.
- **Research Proposal.** Applications for research/monitoring permits must include a research proposal. Proposals must include, as appropriate, all elements outlined in the separate document *Guidelines to Researchers for Study Proposals*.
- **Proposal Review.** Each proposal will be reviewed for compliance with NEPA, the endangered species acts, and requirements of other laws, regulations, and policies. The Arcata Field Manager may also require internal and/or external scientific review, depending on the complexity and sensitivity of the work being proposed and other factors, such as the availability of staff expertise for adequate evaluation. The applicant may expedite review of a proposal by providing existing peer reviews or by providing names and addresses of appropriate persons recommended to assist in review of the proposal.
- **Timing of Review.** The time required to review the permit application and accompanying study proposal will be proportional to the type and magnitude of the proposed research/monitoring. A single visit to the Reserve for a nonmanipulative research project will require a relatively simple proposal, and the permitting decision will be expedited. A highly manipulative or intrusive investigation having the potential to affect nonrenewable, rare, or

delicate resources or needing detailed planning or logistics will require more extensive and longer review.

- **BLM Response.** The principal investigator will receive notice of the approval or rejection of the application by written correspondence via mail, electronic mail, or facsimile. If modifications or changes in a study proposal initially deemed unacceptable would make the proposal acceptable, BLM will suggest them at this time. If the application is rejected, the applicant may consult with BLM staff, clarify issues, suggest modifications, and make an amended application if appropriate.
- **Performance Procedures.** If the proposal is approved, the applicant will receive a copy of a Special Use Permit, which must be signed and returned. The permit will then be validated and an approved copy returned to the applicant, at which time activities within the Reserve may begin. A list of names of all persons involved in field research must be provided to BLM. The lead field researcher must meet with assigned BLM staff at the Arcata Field Office immediately prior to the first field visit. A copy of the permit must be carried at all times by all field staff while performing authorized activities at the Reserve. The permit must also be displayed prominently on all vehicles accessing the site.

Fire Management

Management Goals

The desired outcome of management of the Reserve is a dominance of old-growth redwood and Douglas-fir forests on uplands, interspersed by mature riparian vegetation along all of the watercourses. Some patches of earlier successional seral stages would be present, as a result of disease, windthrow, and infrequent fire. The fire regime would replicate the natural fire regime prior to the era of fire suppression and timber entry, to the degree that it is consistent with the need to protect resources of adjoining properties and the need to protect the Reserve from unnatural catastrophic fire originating on surrounding lands managed for timber production. The fire frequency would be on the order of 100 to several hundred years.

The following goals to achieve this desired outcome are established:

- Restoration of shrub-dominated sites and earlier-successional forest to old-growth forest.
- Protection of old-growth forests from catastrophic fires originating in second-growth forests either outside or inside the Reserve.
- Reduced effects of catastrophic fire on all forests and soils of the Reserve.
- Prevention of the movement of wildfire into or out of the Reserve.

Management Direction

Fuels Treatment

Fuels in second-growth forest will be reduced through tree-density reduction and brush removal in sapling and pole stands, as described in the “Forest Restoration” section above. Thinned stands will be less susceptible to spread of fire. Foliage and smaller stems from removed trees and brush will be lopped and scattered, piled and burned, or chipped. The high rate of biomass

decomposition due to wet and warm maritime conditions at the Reserve will rapidly reduce flammability of lopped and scattered fuels. Broadcast burning is not proposed at the Reserve and will not be employed. Establishment of a shaded-fuelbreak network is not needed and is not appropriate, because the entire second-growth stand area will be treated to acquire the character of a shaded fuelbreak as it recovers old-growth characteristics.

Fuel loading in second-growth stands will be managed in a manner that reduces fuel loading and continuity throughout and therefore reduces fire risk. Fuels will not be managed in old-growth forest and generally not in second-growth forest once it achieves early-mature seral stage.

Fire Suppression

A universal mode of fire suppression (e.g., full suppression) will not be employed throughout the Reserve. Factors to be considered for any incident will be fuel loads and stand flammability, fuel and atmospheric humidity, wind direction and predictability, fire location with respect to topography and roads, risk of severe damage to old-growth forests, risk of fire escape to adjoining ownerships, and other site-specific factors. All fires will be managed to minimize loss of unharvested forest stands and impacts of fire suppression activities in old-growth.

In all areas of the Reserve, suppression response would entail a *minimum-impact strategy*, but it would recognize California Department of Forestry and Fire Protection's (CDF's) mandate to *contain* wildland fire. Suppression response would vary between fire in old-growth stands and fire in second-growth stands, as described below. Second-growth stands are the most susceptible to fire spread and have the highest capability for carrying fire into old-growth stands on the Reserve or into adjacent timber lands. Conversely, the risk of the development of a catastrophic fire is much less for fire originating within old-growth stands than in second-growth stands. Fire in second growth stands would nearly always be met with an immediate response to extinguish it fully by either direct or indirect means, as appropriate to the situation. Instances of monitoring fire in second-growth stands without immediate suppression would be rare. The latter approach may be considered in some instances where extensive fuels treatment has occurred, and topographic and weather conditions are highly favorable.

Implementation Guidelines

Initial attack on fires within the Reserve may be made by BLM or CDF personnel. Responsibility for suppression will lie with CDF, and fire suppression will be carried out consistent with the following guidelines wherever and whenever unacceptable risks to life and property are not created. Details of fire suppression operations will be outlined through a specific operational plan developed jointly with CDF.

Fire Suppression Strategies in Second-Growth Forest

The ridgetop road system along the southern boundary of the Reserve will be maintained by PALCO and will be the primary ridgeline road for intercepting advancing fire from either inside or outside of the Reserve. PALCO roads will also remain open to Elkhead Springs and around the vicinity of the Reserve.

Suppression strategy will reflect site-specific fuels condition and forest-restoration condition. Containment will be accomplished by using dozer lines, hand lines, or wet lines as appropriate and consistent with the minimum impact strategy. Fire lines will be tied into existing roads to the fullest extent possible. Watershed boundaries will be fully utilized, particularly around the southern boundary. During the period of recovery of second-growth forest to old-growth forest, several existing ridgetop fuelbreaks (old skid roads) within the Reserve will remain available and accessible from the south boundary.

If necessary, dozers can be used for fire suppression, but their use will be confined to ridgetops to the extent possible. Natural barriers should guide configuration of fire lines where feasible. Resource damage from dozers will be minimized, and full rehabilitation of dozer fire lines will be required after fire suppression.

Chemical retardants and foam suppressants may be used in the Reserve in second-growth stands according to appropriate guidelines to protect watercourses.

Fire-Suppression Strategies in Old-Growth Forest

Access to old-growth forest will be available from existing road systems at Salmon Pass, Alicia Pass, and the entire length of the N09 road through the southern end of the Reserve. Helispots should be developed in recent clearcuts at the north end of main old-growth grove to hasten access. Helispot development would also speed access into second-growth areas in the Little South Fork Elk River watershed.

The suppression strategy will be to monitor all fire starts and develop an appropriate management response that varies whether the fire burns on the forest floor or in the forest canopy. Fires may be allowed to burn if weather, fuel, and topographic factors are favorable. If not, hand crews or helicopter bucket drops will be deployed to attempt to contain ground fire. For snag or individual tree fires, helicopter bucket drops will be used. A subsequent operational plan with CDF will identify specific helispot locations and water sources.

Dozers, chemical retardants, and foam suppressants will not be used in old-growth stands.

Visual Resource Management

BLM's Visual Resource Management (VRM) program establishes a method for determining the inherent visual qualities of the landscape and the impacts of human activities on these qualities. The program also includes methods for rating the effectiveness of rehabilitation projects and minimizing visual impacts from new projects. Appendix E describes the VRM program and VRM zones for the Reserve.

Recreation Access Management

Recreation activities in the Reserve must be consistent with the primary purpose for which the Reserve was created—preservation and restoration of old-growth forest ecosystems and related values. Accordingly, recreation on the Reserve will focus on providing recreation experiences related to old-growth and riparian ecosystems, forest and watershed restoration, and sociocultural

and historical use of the Reserve. Management of the Reserve will focus on providing these experiences and not on duplicating the extensive multiple recreation activities and facilities already available at nearby state parks and other public recreation areas. The premier recreation attribute of the Reserve's old-growth forest is that it is not bisected by extensive trails and other forms of development and human use. This management focus will allow for recreation programs and uses that are unique in the Redwood Region, while meeting the mandate to give primary emphasis to ecosystem protection. Visitors accessing the proposed trails will know that they are seeing a place where nature is protected in its most pristine form. Other types of recreation activities, such as those with a sporting or competitive emphasis, are already well served by parks and other public lands in the region (see chapter 3 for a description).

Management Goals

The desired outcome of management of public access to the Reserve is a careful balance between maintaining ecosystem integrity and providing opportunities for public environmental education and contemplation of the earth's ancient forest heritage (see appendix F, "Visitor Management Zones"). To achieve this desired condition, the following goals for management of recreation access are established:

- Continue opportunities for year-round, outstanding environmental interpretation and education at the Reserve.
- Provide the minimal necessary facilities needed to support the recreation program.
- Enable frequent contact between visitors and managers to promote environmental education and maintenance of ecosystem integrity.
- Offer a continuing program of outreach to local and regional schools and environmental organizations to foster environmental education and support for Reserve restoration and maintenance activities.
- Minimize disturbance to adjoining residents and landowners caused by visitors to the Reserve.
- Offer interpretation of appropriate historic properties.
- Increase opportunities for visitors' sociocultural and educational experiences.
- Provide a trail network and use strategy with an appropriate level of access to the Reserve's resources.

Management Direction

Access to the Reserve

Public road access to the northwestern end of the Reserve will continue to be provided year-round by the Elk River Road, which is regulated and maintained by Humboldt County.

Under some alternatives (see chapter 5, "Management Alternatives"), access to the southern portions of the Reserve would continue to be provided seasonally by the County's Newburg Road and PALCO's Felt Spring Road. This route will continue to be closed during the rainy season. Use of the southern access may continue to be limited to guided access or may be made available to unescorted individual vehicles during appropriate periods, depending upon the alternative

selected (chapter 5). A visitor center may be developed in Fortuna to facilitate use of the southern access if need, interest, and funding are available.

General Access Provisions

By law, recreation activities in the Reserve must be supportable with minimal facilities and conducted so as to preserve ecological integrity of the Reserve's ecosystems. Parking and trailhead facilities will be developed consistent with the trail extent and trail use alternatives selected (chapter 5). Permanent restroom facilities will be developed at the Elk River Trailhead and at Salmon Pass.

All visitor access will be provided on designated trails. Possession of firearms will not be allowed. In the Elk River Corridor, trail spurs would be constructed to the river, to cultural interpretive sites, and to developed picnic sites (figure 4-2). Dogs would be allowed in the Reserve on leash or within voice control, consistent with existing county ordinance, and only on the Elk River Corridor Trail. Depending upon levels of use, dog owners may be required to pick up and dispose of dog waste. Throughout the Reserve, visitors will be encouraged and required to contain food items in designated picnic sites and to pack out food scraps and other waste. BLM rangers will be present in the Reserve as necessary to ensure compliance with rules and regulations and to serve as recreation resources to the interested public.

Regardless of the trail-extent and trail-use alternatives selected, all activities within the Reserve will be subject to general management direction of BLM's various visitor management zones and visual resource management classes. These zones and management guidelines are described in appendices E and F. Three visitor management zones will be recognized:

- Zone 1, unharvested forests, will be managed to be essentially free of visitors and human-made features.
- Zone 2, harvested forests, will be managed for predominantly natural or natural-appearing environments with relatively light visitor use.
- Zone 3, Elk River Corridor, will be managed as a natural-appearing environment with considerable visitor use.

Recreation Program

The Reserve will be available to individuals and organizations for nature study and photography, interpretive walks, school and community outreach programs, and special thematic events related to the unique forest resources of the Reserve. BLM will organize or sponsor many of these activities on a regular basis, either on its own initiative or in response to requests from interested organizations. Activities will include opportunities for docent-led exploration. The purpose of these activities will be to impart environmental knowledge, foster respect for ecological systems, and nurture support for restoration and preservation of the Reserve's unique ecological resources. To facilitate participation in such activities, an open-air pavilion for recreation events would be constructed a short distance beyond the Elk River Trailhead. Interpretive kiosks would be installed at trailheads, and two short trails to historical resources would be constructed in the Elk River Corridor. The range of planned activities is described under "Implementation Guidelines" below.

Trail System and Uses

Reserve access will be facilitated by an interpretive trail system to allow visitors to experience old-growth ecosystems and riparian ecosystems along the Elk River and Salmon Creek. Alternatives for the extent of such access (chapter 5) are formulated on the basis of the degree of visitor contact with old-growth ecosystems that would be accommodated, and therefore on the basis of the degree of preservation of old-growth and aquatic ecosystems that would be provided. In addition to the three trails now available for use, eight trails are presented in chapter 5 and analyzed in this document.

To facilitate interpretive experiences and environmental education, the primary mode of use of the trail system will be for walking and hiking. In chapter 5 ("Management Alternatives"), alternatives for use by equestrians and bicyclists are presented. Use of some or all of the trails will be restricted on seasonal and hourly bases to protect nesting of marbled murrelet and northern spotted owl and to protect trails or access roads from erosion and impacts of use during wet conditions.

To contain the spread of food items, which could attract scavenger species in the Reserve, picnic sites will be limited to the Elk River corridor as noted above, with an additional site situated along the New Little South Fork Elk River Trail (if that trail is constructed; see chapter 5, "Management Alternatives").

Extension of the Elk River Corridor Trail beyond the confluence of the South Fork and Little South Forks of the Elk River was initially considered for some alternatives but was eliminated because the narrowness of the public land corridor would serve as an inducement for trespass on privately owned industrial timberlands (see appendix J, "Alternatives Considered but Eliminated").

Use of bicycles on steeper, narrow trails was initially considered for some alternatives but was eliminated because of trail safety, sedimentation, maintenance, and wildlife concerns (appendix J). Bicycle use also conflicts with the management intent of the Reserve for contemplative, interpretive-oriented recreation. Equestrian access from the southern access was initially considered for some alternatives but was eliminated because of absence of a suitable location for a parking area large enough that it could serve for horse loading and unloading (appendix J).

Implementation Guidelines

Guidelines are given below for the range and content of the recreation program, trail construction and maintenance, and control of spread of nonnative plants into the Reserve by equestrians.

Recreation Program

Themes

The Reserve will include the following interpretive themes:

- **Value.** The unique value of the Headwaters Forest results from its diversity and rare type of habitat.

- **Dwelling place.** The Headwaters Forest is a home. In the past it was a home to Native Americans, followed by residents of Falk. Today it is critical habitat for many important plants and animals.
- **Preservation.** The Reserve was established by the efforts of many people from various levels of government and segments of the public.
- **Stewardship.** The Reserve is part of our public heritage; individuals can each make a positive contribution to the health of the Reserve so it will be enjoyed for generations to come.

Interpretive Facilities

Several facilities will be constructed at the Reserve to support the interpretive program:

- **Outdoor Interpretive Kiosk.** Providing orientation information and an introduction to prominent natural and cultural features in the Reserve. Material will focus on actions that reduce visitor impact.
- **Pavilion.** Situated in view of evident historical landmarks and natural features of a changing habitat, this sheltered arena will serve as a meeting area for recreation discussion and activities. It will be used for specialized thematic events, school groups, and organized walking groups.
- **Interpretive Trails**
 - *Self-guided Trail.* Guided by a pamphlet, visitors will experience marked points of unique historical interest, with information intended to promote a multicultural interest in and respect for the resources of the area.
 - *Trail to Train Barn.* Guided by infrequent signs at key points along the trail, visitors will be encouraged to act responsibly in relation to remnant artifacts and natural resources.
 - *Bungalow Trail.* Guided by infrequent signs at key points along the trail, visitors will be encouraged to act responsibly in relation to natural resources.

School-Focused Educational Programs

- *Preliminary school outreach programs*—programs in local schools to promote interest in preservation of the Reserve, using photographic slides or electronic presentations, to focus on historical and natural resources.
- *Headwaters-Falk historical curriculum*—a grades 4–12 curriculum focused on the townsite of Falk. (The program has already been developed and distributed to local schools, and distribution will continue.)
- *Headwaters Forest natural science curriculum*—a grades K–6 curriculum for local schools that focuses on the interpretive themes and unique natural and historical resources of the Reserve.
- *School site programs*—continued involvement with schools that participate in the preliminary school outreach program. Sessions may be preparatory to field trips.
- *Reserve field trips*—field programs presented to local school groups at the Reserve. Programs would involve hands-on, interactive approaches focused on the natural and cultural

values of the Reserve designed to encourage stewardship of public lands by the younger generation.

Interpretive Programs

- *Guided interpretive walks*—guided interpretive walks that focus on the interpretive themes as expressed by the interesting natural and cultural features of the Reserve. Walks would be scheduled in the nonrainy season.
- *Community outreach programs*—a series of programs that focus on specific resource issues and historical events of relevance to the broad community.
- *Specialized thematic events*—events that take place at a centralized meeting area where a variety of walks, talks, displays, and activities will be made available. Programs will focus on a specific unique feature of the Reserve.

Trail Construction and Maintenance Guidelines

The following guidelines will be employed in the development of new trail elements, conversion of roads to trails, and maintenance of trails:

- Buffer all recreation access, restoration activities, trail construction or maintenance activities, or other work requiring use of motorized equipment from marbled murrelet and northern spotted owl nesting habitat during the period of February 1–September 15. Use vegetative screening or topographic screening, establish seasonal operating periods, or create a distance buffer of up to 0.25 mile, as determined in consultation with USFWS.
- Minimize disruption of natural hydrologic flow paths, including diversion of streamflow and interception of surface and subsurface flow.
- Avoid sidecasting to prevent the introduction of sediment into streams.
- Minimize sediment delivery to streams from trails. Outsloping of the tread surface is preferred, except in cases where outsloping would increase sediment delivery to streams or where outsloping is unfeasible or unsafe. Route drainage away from potentially unstable channels, fills, and hill slopes.
- Provide and maintain fish passage at all crossings of existing and potential fish-bearing streams.
- Replace culverts and bridges only during times of low streamflow but prior to upstream migration of adult anadromous salmonids. Replacement activities should avoid, to the extent feasible, removal of any riparian vegetation.
- Use materials for bridge repair, replacement, or temporary crossings that minimize the possibility of introduction of fine sediments or toxins into the drainage system.
- Minimize disturbance to riparian reserves for bridge and stream-crossing replacement. Disturbed ground should receive appropriate erosion control treatment (mulching, seeding, planting, etc.) prior to the beginning of the wet season.
- Maintain foot trails to gradients not to exceed 10%. Pitch grades up to 15% may be used to a maximum of 100 feet, provided erosion can be prevented.
- Develop new trail treads that are 18–48 inches wide.

- Limit culvert use to locations where no other methods are feasible (e.g., grade dips, water bars).
- Keep switchbacks to a minimum wherever possible. Design switchbacks with curve radii as long as possible, with an absolute minimum of six feet for pedestrian use.
- Use native soil to construct new trails to the extent possible.
- Consult and follow the additional trail design specifications described in BLM Handbook 9114-1.

Guidelines for Preventing the Spread of Noxious Weeds and Pathogens by Equestrians

The following guidelines for preventing the spread of noxious weeds and pathogens through any equestrian activity at the Reserve have been synthesized from the California BLM's Weed Prevention and Management Guidelines, Nevada BLM's weed prevention web site, recommendations from the University of Colorado and University of California Extension services, recommendations from the Arizona Department of Agriculture, and recommendations of University of California, Davis, faculty of the School of Veterinary Medicine.

- Post interpretive/regulatory signs at equestrian parking areas that state the following guidelines and explain that the Reserve is to be managed to maintain ecological integrity for native species and that with public cooperation the risk of nonnative species and pathogen introductions can be minimized.
- Avoid moving horses from weedy areas to weed-free areas (i.e., Headwaters) when weeds are producing viable seeds. This is a seasonal guideline; in some periods of the year, grazing on noxious weeds will not result in any viable reproductive plant parts being ingested or passed in feces.
- If horses have been grazing in a weedy area that is flowering and going to seed, place animals in a holding area for a minimum of 48 hours (96 hours is recommended), and feed them hay or pellets known to be free of weeds. This method would eliminate all existing viable seeds from the animal, and any feces dropped on public lands will not contain any nonnative, invasive weed parts capable of propagation.
- Ensure that hay and bedding in horse trailers are weed-free. If there is any question about possible weed seed content, contact the agricultural extension office in the area where the hay or bedding was produced.
- Deworm horses regularly, particularly a few days prior to visiting the Reserve.
- Develop trail watering sources that are isolated from the Reserve's streams and drainages and do not overflow and create runoff.
- Prevent horses from entering streams and streambank areas.
- Meet with local equestrian groups and provide them with information on preventing weed spread.
- Post guidelines on the Internet and make available for distribution via mail.

Cultural Resource Management

Management Goals

The desired outcomes of cultural-resource management are to preserve significant cultural resources, acquire information about past human activities that can be extracted from these resources, and communicate this information to researchers and the public. Thus, three goals are established:

- Permanently protect all significant cultural resources from natural or human-caused disturbance or destruction.
- Extract all information about past human activities that the resources may hold.
- Offer ongoing interpretation of acquired information for the public.

Management Direction

Determine NRHP Eligibility of Reserve's Properties

The primary management direction in the near term is to prepare NRHP nominations for all eligible historic properties within the Reserve and obtain a determination of which sites are suitable for listing. Three cultural properties within the Reserve are potentially eligible and will be nominated to the NRHP as follows:

- the "Old Military Trail";
- the ridgetop prehistoric site; and
- a historic district that includes the townsite of Falk, the Elk River Mill and Lumber Company millsite, the Bucksport and Elk River Railroad, Maggie's Camp, Creek House, and the End-of-the-Line site, all related to the early logging era.

The Old Military Trail is potentially eligible under NRHP criterion (a) for its association with the Indian Wars of Northwest California in the 1850s. The ridgetop prehistoric site is potentially eligible under criterion (d) for its potential to yield information important in prehistory. The thematic historic district is potentially eligible under criteria (a), (c), and (d). Because of its disturbed condition, the townsite of Scribner is recommended as ineligible for the NRHP.

A research plan leading to formal NRHP nominations for these sites will be developed and implemented. Until formal NRHP eligibility determinations are made in consultation with SHPO, each of the known sites will be managed as if it were a significant cultural resource. If sites are found suitable for listing, management plans will be prepared for each, addressing preservation actions, including management of site visitation.

Protection

BLM will enforce laws against illegal resource use by patrolling all potential NRHP sites and the locations around them where public access is likely. Administrative and physical measures to protect all historic properties within the Reserve will include monitoring of resource condition,

surveillance by law enforcement personnel in potential problem areas, posting signs to inform the public of the consequences of removing or disturbing cultural resources, fencing of resources, public education, and involvement of interested parties in conformance with the Archaeological Resources Protection Act. To minimize the potential for site disturbance, cultural resource staff will help define areas unsuited to particular recreation uses, such as picnicking and trail alignment.

Information Acquisition

BLM will consult further with affected Native American tribes and schedule tours of the Reserve for their elders and youth to gather more information about traditional use areas and activities.

The process of nominating sites to the NRHP will involve acquiring further information about the potentially significant sites. An archaeological testing program will be implemented at the ridgetop prehistoric site to collect surface artifacts and analyze the site's NRHP eligibility and research potential. Resources will be collected at some of the locations around the townsites of Falk, the Elk River Mill and Lumber Company, and Maggie's Camp to assure their preservation.

Interpretation and Native American Use

A recreation program (described in "Recreation Access Management" above) will be developed around the Reserve's significant cultural properties. The program will include trailhead information signs, interpretive spur trails in the Elk River corridor, guided interpretive walks, in-school and in-Reserve educational sessions, and public events organized around historic and/or prehistoric themes.

Native American requests to practice traditional activities or participate in interpretive activities within the Reserve will be welcomed and will be approved on a case-by-case basis, consistent with the overriding purpose of Reserve management—preservation of ecosystem integrity—and other management direction in this chapter.

Implementation Guidelines

All cultural resources known or expected to occur on public land within the Reserve will be managed for their information, public, or conservation values as per BLM Manual 1623, the Federal Land Policy and Management Act, and the National Historic Preservation Act. Guidelines for managing cultural resources are found in the revised BLM 8100-series cultural resource management manual sections (up to 2001) and under the National (1997) and California State (1998) Programmatic Agreements between the Office of Historic Preservation and BLM.

If any cultural materials or sites are encountered during ground-disturbing activities within the Reserve (e.g., pavilion construction, trail construction, watershed restoration), all work will be stopped until the find is evaluated by a qualified archaeologist.

Special Areas Designation and Management

Sections 201 and 202 of the Federal Land Policy Management Act (FLPMA) require that BLM “prepare and maintain on a continuing basis an inventory of all public lands and their resources and other values (including, but not limited to, outdoor recreation and scenic values), giving priority to areas of critical environmental concern.” Based on such inventory, several potential special area designations may apply to part or all of the Reserve. This plan therefore addresses qualifications of Reserve lands for special designations and the implications to Reserve management of special designations. Potential special-area designations for some or all of the Reserve include

- Area of Critical Environmental Concern/Research Natural Area,
- Special Recreation Management Area,
- National Register of Historic Places,
- Wilderness Study Area,
- National Wild and Scenic River System, and
- State of California Ecological Reserve.

Area of Critical Environmental Concern/Research Natural Area

Background

Area of Critical Environmental Concern (ACEC) is a type of special area recognized by BLM for elevating management needs and funding for public lands supporting unique and sensitive environmental resources that may be threatened with degradation or loss. An ACEC is an area for which special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish or wildlife resources, or other natural systems or process, or to protect life and safety from natural hazards.

Research Natural Areas (RNA's) are areas that contain important ecological and scientific values and are managed for minimum human disturbance. RNA's are primarily used for non-manipulative research and baseline data gathering on relatively unaltered community types. Since natural processes are allowed to dominate, RNA's also make excellent controls for similar communities that are being actively managed. In addition, RNA's provide an essential network of diverse habitat types that will be preserved in their natural state for future generations.

By nature of its establishment (chapter 5), the entire Reserve is considered to be an ACEC/RNA. The Reserve supports a unique old-growth forest of coastal redwoods and Douglas-fir and a unique forest understory comprising a great diversity of nonvascular plants. It provides freshwater habitat for three endangered anadromous fish species and nesting habitat for two endangered bird species—the marbled murrelet and the spotted owl. Approximately 25% of the reproductive activity of marbled murrelet in the southern Humboldt region occurs at the Reserve, and the Reserve is the southernmost extent of the bird's nesting habitat in Northern California. These values could easily be degraded through unrestricted human visitation. As an ACEC/RNA, the Reserve will have a primary use of non-manipulative research and baseline data gathering, and serve as a control for similar vegetation communities that are being actively managed

Management Goals and Direction

ACEC/RNA designation is consistent with the desired outcome of all of the management programs addressed by this plan. Similarly, designation does not impose any additional management direction—either restrictions on allowable uses or needed management actions—to that direction prescribed in the other sections of this chapter. As noted, however, ACEC/RNA designation will elevate management funding priority in the nationwide funding system for BLM-managed lands. The ACEC/RNA designation is common to all alternatives.

Implementation Guidelines

None.

Special Recreation Management Area

Special Recreation Management Area (SRMA) is a type of special area recognized by BLM for purposes of elevating management needs and funding for lands that require special management of recreation activities. These are areas that require special management attention due to a concentration of recreation uses or values, contain Congressionally or administratively designated areas, have similar or interrelated recreation values that require a substantial management commitment, or have recreation as a principle management objective identified through the land use planning process.

Recreation demand for the Reserve is significant, because of both the proximity to the Humboldt Bay urban area and the statewide and national attention focused on it during its creation. The legislation creating the Reserve requires that this plan address providing recreation opportunities and ensure that recreation facilities be the minimal necessary so as to maintain ecological integrity of the Reserve. Therefore, any recreation provided for in the Reserve (see “Recreation Access Management” above) must be managed carefully to ensure preservation of the Reserve’s unique environmental values. Such management will require a significant management presence and restricted scheduling of management actions – both of which will require special funding priority.

Management Goals and Direction

As with ACEC/RNA designation, SRMA designation is consistent with the desired outcome of all of the management programs addressed by this plan. Similarly, designation does not impose any additional management direction—either restrictions on allowable uses or needed management actions—to that direction prescribed in the other sections of this chapter.

Implementation Guidelines

None.

National Register of Historic Places

As previously noted, listing on the NRHP under section 106 of the National Historic Preservation Act is a means of recognizing the cultural value of an extant historical resource and of providing for its legal protection. Candidate resources are evaluated by BLM and, if certain criteria are met, nominated for inclusion on the register. Actual designation is determined by a state, federal, or tribal Historic Preservation Officer. For listed properties, cultural resources management plans must be prepared.

Three historical properties at the Reserve qualify for and will be nominated to the register. They include the townsite of Falk and the abandoned railroad, both in the Elk River corridor, and the historic military ridge trail that traverses the major ridge and old-growth grove of the Reserve. Management goals, direction, and implementation guidelines are described in the “Cultural Resources” section of chapter 4.

Wilderness Study Area

Consistent with provisions of FLPMA Section 202, public lands having wilderness characteristics are evaluated for candidacy for inclusion in the national Wilderness System through a specific process described in BLM’s wilderness inventory and study procedures handbook (DOI BLM 2001). A two-part process—inventory and study—can result in the designation of a Wilderness Study Area (WSA). WSA designation imposes specific management restrictions on designated lands (DOI BLM 1995b), and thereby preserves the WSA in such a condition that Congress may consider including the area in the national Wilderness System.

Management Goals and Direction

When the Wilderness inventory step was applied to the Reserve (appendix G), it resulted in a finding that a 5,885-acre area of the Reserve (80%) could meet the minimum size requirement for a WSA. This area was then subjected to the Wilderness study step (appendix G). After this evaluation of the quality of wilderness values, and in particular, the degree of naturalness of various parts of this area, manageability, and other resources and uses, three alternatives for WSA designation were identified:

- all of the inventoried area,
- all except areas of the most recent logging (shrub sapling harvested and pole harvested seral stages excluded), or
- none of the area.

These alternatives and their management implications (e.g., curtailment of forest restoration actions, prohibition of bicycle use) are described in chapter 5; consequences of these alternatives are described in chapter 6.

Implementation Guidelines

Guidelines for managing lands under wilderness review are found in BLM Manual section H-8550-1 (DOI BLM 1995b).

National Wild and Scenic River System

The Wild and Scenic Rivers Act of 1968 (PL 90-542, as amended) established a method of providing federal protection of remaining free-flowing rivers and preserving them and their immediate environments for the use and enjoyment of present and future generations. Section 5(d)(1) of the Act provides that wild and scenic river considerations be made during Federal agency planning. Either Congress, or the Secretary of the Interior, upon the nomination of the Governor of the State of California, may designate rivers as part of the National Wild and Scenic River System (NWSRS). Pursuant to this mandate, an evaluation of river resources within the Reserve was conducted according to the three steps of the NWSRS study process (appendix H):

- Determine what rivers or river segments are eligible for NWSRS designation.
- Determine the potential classification of eligible river segments as wild, scenic, recreational, or any combination thereof.
- Conduct a suitability study to determine if the river segments are suitable for inclusion in the NWSRS.

Management Goals and Direction

The study (appendix H) resulted in a finding that all three perennial streams in the Reserve are eligible and potentially suitable for inclusion:

- South Fork Elk River (1 mile recreational, six miles scenic);
- Little South Fork Elk River (5 miles wild); and
- Salmon Creek (5 miles scenic).

Upon study of suitability, two alternatives for inclusion were identified: include all three streams or include none of them. These alternatives, and their management implications are described in chapter 5. Consequences of these alternatives are described in chapter 6. In the case of the Reserve, inclusion of these streams in the NWSRS would neither restrict any allowable uses nor require any management actions other than those already proposed for the Reserve in other sections of this chapter, regardless of what alternatives are chosen for restoration, recreation access, or other program areas.

Implementation Guidelines

General guidelines for managing components of the NWSRS are found in the Wild and Scenic Rivers Act of 1968 (Public Law 90-542, as amended). The law calls for development of a specific management plan for each river included in the system. Before a management plan is completed, interim management guidelines for designated Wild and Scenic Rivers would be applicable (DOI BLM 1992).

State of California Ecological Reserve

The State of California establishes ecological reserves to provide protection for rare, threatened, or endangered native plants, wildlife, aquatic organisms, and specialized terrestrial or aquatic habitat types. The California Fish and Game Commission enacts the designations.

Management Goals and Direction

Two alternatives related to ecological reserves are available: designation or no designation. These alternatives and their management implications are described in chapter 5; consequences of these alternatives are described in chapter 6. Designation would preclude hunting, camping, fires, swimming, and operation of aircraft or hovercraft in the Reserve, unless these uses are expressly provided for in designation action.

Implementation Guidelines

Guidelines for management of ecological preserves are found in the California Administrative Code for the Fish and Game Commission under Title 14, section 630 (Appendix I).

Off-Highway Vehicle Designations

Consistent with the provisions under FLPMA and other authorities listed in 43 CFR 8340.0-3, public lands must be designated as open, limited, or closed with respect to the use of off-highway vehicles.

Management Goals and Direction

Off-highway vehicle use within the Reserve is considered inconsistent with the legislated priority of preservative of ecological integrity. The Reserve is designated as closed to the use of off-highway vehicles per 43 CFR 8242.2.

Implementation Guidelines

None

Resource Monitoring and Evaluation

This section describes resource monitoring and evaluation that will be conducted by BLM and DFG as a part of implementation of this plan.

Management Goals

The desired outcome of resource monitoring and evaluation is a clear understanding of the ecological structures, function, and processes that characterize the Reserve and the effects of human intrusion on those attributes. Accordingly, the management goals for the monitoring and evaluation program are as follows:

- Provide the basis for long-term adaptive management and ongoing planning.
- Assess compliance with environmental laws.
- Ensure that direction in the authorizing legislation to maintain ecosystem integrity at the Reserve is fulfilled.

The primary environmental laws of concern are ESA, CESA, and mitigation monitoring requirement of CEQA. Regarding the former, the proposed actions described in this chapter were developed in a manner to preclude the occurrence of significant environmental impacts caused by plan implementation; thus, no additional mitigation measures are required (see chapter 6, “Environmental Consequences (Environmental Effects and Alternative Comparisons)”). Technically, therefore, no monitoring of mitigation implementation monitoring is required under CEQA other than the monitoring required for the other purposes described above.

Management Direction

Monitoring

Table 4-7 describes the anticipated monitoring requirements for plan implementation. These requirements are arranged by program area (e.g., species management, watershed restoration, forest restoration, fire management), according to the attribute to be monitored. Monitoring results for one program area, however, will be of concern to other program areas, as indicated by the assessment of environmental consequence in chapter 6. The table presents the following elements for the attributes to be monitored:

- attribute to be monitored,
- monitoring purpose,
- specific indicator(s) of attribute to be measured,
- appropriate frequency and duration of measurement, and
- monitoring results indicating a need for reevaluation of management actions.

Evaluation and Adaptive Responses

Monitoring results will be evaluated immediately upon collection each year and annually reevaluated as an integrated whole preceding the budget planning process. Because the purpose of monitoring is to guide plan implementation, a detailed evaluation and an adaptive response will be developed when monitoring results indicate that undesired outcomes are occurring. These adaptations may require a refinement or modification of planning direction in this chapter. If a significant management modification is indicated, an amendment of this plan may be required (see chapter 1, “Introduction”). Significance is usually associated with monitoring results that

indicate management direction for various plan elements are inhibiting achieving management goals of another plan element (e.g., a significant conflict between recreation access and species management is developing). In such cases, the required adaptation will be formulated to give priority to the primary purposes for which the Reserve was created: maintenance of ecological integrity and preservation of old-growth ecosystems.

Implementation Guidelines

Monitoring

Table 4-7 lists implementation guidelines for monitoring. All monitoring and evaluation activities will be fully documented. Monitoring and evaluation reports should indicate monitoring methodologies, results, and conclusions. Conclusions will include assessment of measured results against expected results, implications to the prospect for meeting management goals in any program area, determination of acceptability of results, and formulation of measures that could bring about desired changes to monitored attributes.

Evaluation

Data from the resource monitoring and other sources will serve as input for a formal evaluation of the planning decisions to determine progress in implementation, and to see if any amendments or revisions to the plan are necessary (see chapter 1). The evaluation will be completed at least once every four years and will address the following questions (from BLM Handbook 1601-1):

- Are actions outlined in the plan being implemented?
- Does the plan establish desired outcomes (i.e., goals, standards, and objectives)?
- Are the allocations, constraints, and mitigation measures effective in achieving desired outcomes?
- Do decisions continue to be correct and proper over time?
- Have there been significant changes in the related plans of Indian tribes, state and local government, or other federal agencies?
- Are there new data or analysis that significantly affect the planning decisions or the validity of the NEPA analysis?
- Are there unmet needs or opportunities that can best be met through a plan amendment or revision, or will current management practices be sufficient?
- Are new inventories warranted pursuant to BLM's duty to maintain inventories on a continuous basis (FLPMA Section 201)?
- Are there new legal or policy mandates as a result of new statutes, proclamations, executive orders, or court orders not addressed in the plan?

Management Revenue and Expenditures

Management Goals

The desired outcomes and management goals for the revenues and expenditures program described in this plan are that plan implementation is fully funded and executed in the most cost-effective manner and that revenues to support Reserve management are provided primarily by governmental appropriations or grants and donations, and less so from visitation.

Management Direction

Funding of Plan Implementation

Full implementation of the proposed plan will be sought and will include completion of the selected watershed restoration program and forest restoration program within five years of final plan approval and construction of the selected trail system, including required appurtenant facilities, within three years of plan approval. The monitoring program will be implemented in the first year of plan adoption and will continue annually. Table 4-8 shows estimated costs for management of the Reserve, including one-time costs, such as for restoration or trail construction, and ongoing annual costs. Depending on the restoration and access alternatives selected, remaining one-time costs range from \$3 million to \$7.2 million. Annual operating costs are estimated to be \$530,000–\$570,000.

The current interagency agreement for funding of the Reserve includes a 2/3 to 1/3 split between the federal and state government in responsibility for public funding of both the one-time development of the Reserve and the annual management costs in perpetuity. Contributions and grants from sources will continue to be sought to help meet costs of restoring and improving the Reserve.

Efficiency of Management

The most cost-effective means of fully implementing the plan will be used. Direct management authority will reside with BLM's Arcata Field Office. The Field Manager will direct plan implementation. Staff specialists in watershed and forest restoration, recreation services, ecosystem preservation, and management services will oversee plan implementation. DFG will provide financial support and advice to the BLM Field Manager. In accordance with the MOU between BLM and DFG, and the State of California conservation easement over the Reserve, major decisions affecting the Reserve will be made jointly by BLM and DFG.

BLM will undertake plan improvements (i.e., watershed restoration, forest restoration, and construction of recreation facilities) by using contractors conducting business in the geographic area encompassed by the Northwest Forest Plan. Design of implementation projects may be done in-house or by use of contractors, whichever is most cost effective. Cost effectiveness includes consideration of both least cost and degree of attainment of quality and schedule goals. Contractors may be either nonprofit or for-profit contractors.

Use Fees

In addition to contributions, costs of plan improvements will be met by federal-state appropriations, because these actions are logical extensions of the federal-state acquisition. These costs include costs for watershed restoration, forest restoration, and construction of recreation facilities. For meeting annual operation costs in perpetuity, some reliance upon Reserve visitors may be considered.

Alternatives for the charging of fees for interpretative/educational use are described in chapter 5. They include four alternatives:

- **Universal user fee.** All users of the Reserve would be charged a daily user fee.
- **Guided hike user fee.** Users of the Reserve participating in guided hikes would be charged a tour fee (or would donate labor).
- **Independent user fee.** All users of the Reserve, except those participating in guided hikes, would be charged a daily user fee.
- **No fees.** Fees would not be assessed for entry into the Reserve.

One of these alternatives will be selected for final plan adoption. A partial or complete waiver of fees may be granted to educational organizations, depending on costs to be incurred by BLM.

The appropriate public use fees and implementation guidelines at the initiation of the plan-implementation period for recreation access would be determined on the basis of a fee study and business plan developed with public input and community support. At the present, fees are expected to be approximately \$3–5 per day, or \$40 annually, for walking access and \$5–10 per day, or \$40–80 annually, for bicycle and equestrian access, if a fee alternative is selected.

Researchers at the Reserve may be charged a fee for covering BLM's costs for processing of research permits. Fees will be established according to an application-specific cost estimate provided by BLM to applicants prior to application submittal and processing. A preapplication meeting between the applicant and agency staff will be required to establish the fee.